

University of Medicine and Pharmacy Tîrgu Mureş

School of Doctoral Studies

Abstract of PhD Thesis:

The Implications of Nutritional Status on Oral Health in Children and Adolescents

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By analyzing the effects of nutrition on oral health in children and adolescents, this PhD thesis addresses an interdisciplinary subject that has important practical implications. As an index of general wellbeing, oral health can be influenced by a range of factors, among which nutrition should take a central role due to its well documented effects on overall health. However, the literature provides conflicting evidence regarding the relationship between nutritional disorders and oral health, especially in pediatric populations.

Both dental caries and nutritional imbalances are complex, multifactorial conditions, that require an interprofessional approach to care and share at least one common risk factor: a person's eating habits. They pose an ongoing challenge for public health services worldwide due to their preventable yet highly prevalent nature. Specifically, dental caries is the most frequently occurring chronic childhood disease, while the incidence of obesity and overweight among children has increased dramatically in recent decades with changes in lifestyle, diet, economic development and industrialization. Thus, nutrition and dietary habits play an important role not only in the etiology of dental caries, but also in the development of different tissues and organs.

Nutritional disorders play a significant role in the dental pathology of the growing child through both short and long term effects. For instance, a nutritional imbalance can affect tooth structure, causing enamel hypoplasia, and can determine qualitative and quantitative changes in saliva. It can also interfere with tooth eruption and reduce the body's defense mechanisms against the oral microbial flora involved in caries development.

This thesis is structured in two parts: the first part includes data from recent literature on different methods of dental age estimation, etiologic factors and prevention methods of dental decay, nutritional disorders, and the relationship between weight status and dental caries. The second part describes the results of personal research, which consists of three studies. The studies were designed and conducted by the author, and are presented in the standard structure of scientific research: aim, material and methods, results, discussions and conclusions.

The first study, titled "The dentist's role in prevention of obesity in children and adolescents", aimed to assess dentists' interest, current attitudes and barriers in providing

nutritional counseling or other obesity prevention interventions in the dental office. This study is an important first step in heightening awareness among the dental community about the importance of weight screening, obesity prevention measures, nutritional education and promotion of healthy eating. For this study, a questionnaire was distributed to 400 dentists. The results suggest a need for clearer clinical guidelines and intervention models in the dental practice. Furthermore, it was found that academic training of dentists in this area is limited, leading to relatively infrequent referrals to specialists and limited monitoring of obese or overweight patients.

The second study, "Clinical and statistical studies on nutritional status, caries intensity and salivary buffer capacity in children" aimed to investigate the relationship between dental caries and weight status on a sample of children from Tîrgu-Mureş, and also evaluate the role of several risk factors associated with dental caries: salivary buffer capacity and tooth brushing frequency. We wanted to test the hypothesis that children with nutritional imbalances are more susceptible to dental caries, and to identify the population subset with elevated risk of tooth decay. The study was conducted on 163 children and focused on the following parameters: Decayed, missing filled teeth index for permanent and deciduous teeth (DMFT and dmft), body mass index (BMI), salivary buffer capacity, estimated using a strip test and tooth brushing frequency. Regarding the dmft index, we found that underweight children had a significant higher dmft index compared to normal weight patients. The normal weight patients presented a significantly lower DMFT index compared to both underweight and overweight/obese patients. Our result showed a negative correlation between both DMFT and dmft and salivary buffer capacity.

The third study titled "Relationship between Body Mass Index and dental age in children's growth period". The aim of this cross-sectional study was to determine whether BMI is associated with dental development in Romanian children, when compared to their chronological age. A sample of 156 children were selected, aged between 6 and 14 years. BMI status was determined for each patient. Chronological age was obtained from the child's birth date and dental age was determined using Demirjian's method on panoramic radiographs. The sample was divided according to the weight status in 3 groups: underweight, normal weight and overweight/obese. Our results demonstrate that underweight patients have a delayed dental development. These patients had a significantly ($p=0.0012$) higher chronological age compared to their dental age. On the other hand, overweight and obese patients presented an accelerated dental development, with the dental age significantly higher ($p=0.0066$). The normal weight group showed no significant differences between dental and chronological age. Nutritional disorders can affect dental maturity are important to consider in dental and orthodontic treatment planning, where timing is crucial.

Keywords: dentist, child, BMI, caries, obesity, dental age, salivary buffer capacity